CLAIMS

What is claimed is:

1. A method of obtaining homologous recombination in somatic stem or progenitor cells, the method comprising:

growing stem or progenitor cells in culture;

inserting a nucleic acid encoding a gene of interest into the somatic stem or progenitor cells;

allowing homologous recombination to occur to produce a homologously recombined stem or progenitor cell; and

selecting a homologously recombined somatic stem or progenitor cell having the inserted nucleic acid.

2. The method according to claim 1, further comprising identifying somatic stem or progenitor cells that remain undifferentiated, express TERT, maintain telomerase activity, and demonstrate a capacity of self-renewal for insertion of the nucleic acid encoding the at least one gene of interest.

3. The method according to claim 1, further comprising identifying homologously recombined stem or progenitor cells producing a product encoded by the at least one gene of interest.

4. The method according to claim 3, further comprising associating the homologously recombined stem or progenitor cell with a pharmaceutically acceptable carrier.

5. The method according to claim 1, further comprising introducing said homologously recombined stem or progenitor cell to a subject.

6. The method according to claim 5, wherein said introducing comprises *in vitro* delivery.

7. The method according to claim 5, wherein said introducing comprises *in vivo* delivery.

8. The method according to claim 5, further comprising selecting a subject incapable of producing a product encoded by the at least one gene of interest.

9. The method according to claim 8, wherein the product is a protein.

10. The method according to claim 5, further comprising selecting a subject incapable of expressing normal levels of a product encoded by the at least one gene of interest.

11. The method according to claim 4, further comprising introducing the homologously recombined stem or progenitor cell and the pharmaceutically acceptable carrier to a subject.

12. The method according to claim 1, further comprising providing a selection medium comprising growth medium for the homologously recombined somatic stem or progenitor cell, the growth medium including a selection agent.

13. The method according to claim 1, further comprising selecting the somatic stem or progenitor cells from the group consisting of glial progenitor cells, mesenchymal stem cells, astrocyte precursor cells, and mixtures thereof.

14. The method according to claim 1, wherein the somatic stem or progenitor cells are glial progenitor cells.

15. The method according to claim 1, wherein inserting nucleic acid into the somatic stem or progenitor cells comprises using a vector capable of homologous recombination.

16. The method according to claim 15, wherein the vector comprises regions of homology with DNA of the stem or progenitor cells.

17. The method according to claim 16, wherein the regions of homology are selected from the group consisting of Rosa locus, RNApolII locus and the beta-actin locus.

18. The method according to claim 17, wherein the regions of homology are from the RNA polr2a locus.

19. The method according to claim 1, further comprising inserting the nucleic acid by a method selected from the group consisting of electroporation, lipofection, cell fusion, retroviral infection, cationic agent transfer, $CaPO_4$, transfection and combinations thereof.

20. The method according to claim 19, wherein the method is electroporation.

21. The method according to claim 1, further comprising introducing an IRES protein at a locus of nucleic acid of the somatic stem or progenitor cells prior to inserting the nucleic acid into the somatic stem or progenitor cells.

22. The method according to claim 1, further comprising identifying a promoter in the nucleic acid and modifying the promoter to alter expression of a product encoded by the at least one gene of interest.

23. The method according to claim 22, further comprising replacing at least a portion of the promoter with a product capable of providing additional regulation of expression of the product encoded by the at least one gene of interest.

24. The method according to claim 5, wherein introducing comprises introducing the homologously recombined stem or progenitor cells to the brain of the subject.

25. The method according to claim 5, wherein introducing comprises introducing the homologously recombined stem or progenitor cells to the spinal cord of the subject.

26. The method according to claim 1, wherein the at least one gene of interest encodes at least one growth factor.

27. The method according to claim 26, wherein the at least one growth factor is selected from the group consisting of platelet derived growth factor, epidermal growth factor, fibroblast growth factor, brain derived neurotrophic growth factor, glial derived neurotrophic factor and ciliary neurotrophic factor.

28. The method according to claim 5, further comprising obtaining multiple homologously recombined stem or progenitor cells.

29. The method according to claim 28, further comprising introducing the multiple homologously recombined stem or progenitor cells to the subject.

30. The method according to claim 29, further comprising evaluating the efficacy of product delivery *in vivo*.

31. A homologously recombined stem or progenitor cell encoding a gene of interest capable of expressing a selected product.

32. The homologously recombined stem or progenitor cell of claim 31, wherein the homologously recombined stem or progenitor cell is capable of expressing an endogenous protein encoded by nucleic acid integrated in the somatic stem or progenitor cell via homologous recombination.

33. The homologously recombined stem or progenitor cell of claim 31, wherein the somatic stem or progenitor cell is selected from the group consisting of glial progenitor cells, mesenchymal stem cells or astrocyte precursor cells.

34. The homologously recombined stem or progenitor cell of claim 31, wherein the somatic stem or progenitor cell is a glial progenitor cell.

35. The homologously recombined stem or progenitor cell of claim 31, wherein the homologously recombined stem or progenitor cells are incapable of expressing MHC class antigens.

36. The homologously recombined stem or progenitor cell of claim 31, wherein the homologously recombined stem or progenitor cells are capable of differentiating.

37. The homologously recombined stem or progenitor cell of claim 31, wherein the homologously recombined stem or progenitor cells are capable of expressing TERT.

38. The homologously recombined stem or progenitor cell of claim 31, wherein the homologously recombined stem or progenitor cells are capable of maintaining telomerase activity.

39. The homologously recombined stem or progenitor cell of claim 31, wherein the stem or progenitor cells are capable of self renewal.

40. A method of gene therapy comprising administering to a subject a homologously recombined stem or progenitor cell such that the homologously recombined stem or progenitor cell express a gene product of interest.

41. The method of gene therapy of claim 40, wherein the homologously recombined stem or progenitor cell expresses an endogenous protein encoded by nucleic acid integrated in the stem or progenitor cell through homologous recombination.

42. The method of gene therapy of claim 40, further comprising selecting the homologously recombined somatic stem or progenitor cells from the group consisting of homologously recombined glial progenitor cells, homologously recombined astrocyte precursor cells and homologously recombined mesenchymal stem cells.

43. The method of gene therapy of claim 42, wherein the homologously recombined somatic stem or progenitor cells are homologously recombined glial progenitor cells.

44. The method of gene therapy of claim 40, wherein the homologously recombined stem or progenitor cell are adapted for used in treating neurological or neurodegenerative disorders.